

UNCLASSIFIED

NAVAL WAR COLLEGE
Newport, Rhode Island

**-Operational Medicine From The Sea-
A Revolution in Medical Affairs**

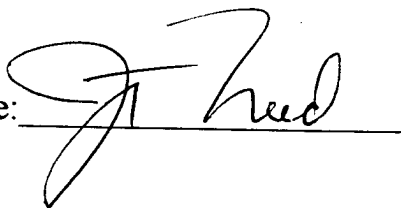
by

James T. Need
CDR, MSC, USN

A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

Signature: _____



13 June 1997

Paper directed by Captain G.W. Jackson, USN
Chairman, Joint Military Operations Department

UNCLASSIFIED

19970814 121

DTIC QUALITY INSPECTED 1

REPORT DOCUMENTATION PAGE

1. Report Security Classification: UNCLASSIFIED			
2. Security Classification Authority:			
3. Declassification/Downgrading Schedule:			
4. Distribution/Availability of Report: DISTRIBUTION STATEMENT A: APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED.			
5. Name of Performing Organization: JOINT MILITARY OPERATIONS DEPARTMENT			
6. Office Symbol: C		7. Address: NAVAL WAR COLLEGE 686 CUSHING ROAD NEWPORT, RI 02841-1207	
8. Title (Include Security Classification): OPERATIONAL MEDICINE FROM THE SEA, A REVOLUTION IN MEDICAL AFFAIRS (U)			
9. Personal Authors: JAMES T. NEED, CDR, MSC, USN			
10. Type of Report: FINAL		11. Date of Report: 13 JUNE 1997	
12. Page Count: 23			
13. Supplementary Notation: A paper submitted to the Faculty of the NWC in partial satisfaction of the requirements of the JMO Department. The contents of this paper reflect my own personal views and are not necessarily endorsed by the NWC or the Department of the Navy.			
14. Ten key words that relate to your paper: OMFTS, OPERATIONAL MEDICINE, REVOLUTION IN MEDICAL AFFAIRS, OPERATIONAL MEDICAL ART			
15. Abstract: The demise of the bi-polar world has changed forever the face of future war for the United States. While our nation is no longer threatened by total nuclear destruction, the variety and complexity of future limited wars will produce tremendous security challenges as we move into the next century. If the US is to remain engaged in world affairs, then it must maintain an expeditionary military capability in order to control, when necessary, the littoral regions of the earth. The United States Marine Corps is developing an operational concept, Operational Maneuver From The Sea (OMFTS), that will enable this country to do just that. But the very strength of OMFTS, with its focus on maneuver, speed, and deception, will in turn demand of Navy Medicine a revolution in medical affairs to overcome considerable combat casualty support challenges. The solutions to those challenges will be found through: the development of new combat care medical doctrine; enhancing the skills and redirecting the focus of those responsible for patient stabilization and evacuation; preparing for a change in casualty profile due to changing weapons and participants; and finally - making the best of technological innovations that will ensure the best care is given to injured Marines. The key to understanding the medical demands of tomorrow's OMFTS lies in gaining an awareness and comprehension of "operational art" from the warfighter's perspective. Only then will Navy Medicine truly understand its role as provider of combat casualty care.			
16. Distribution / Availability of Abstract:	Unclassified X	Same As Rpt	DTIC Users
17. Abstract Security Classification: UNCLASSIFIED			
18. Name of Responsible Individual: CHAIRMAN, JOINT MILITARY OPERATIONS DEPARTMENT			
19. Telephone: 841-6461		20. Office Symbol: C	

Abstract of

-Operational Medicine From The Sea- A Revolution in Medical Affairs

The demise of the bi-polar world has changed forever the face of future war for the United States. While our nation is no longer threatened by total nuclear destruction, the variety and complexity of future limited wars (and missions other than war) will produce tremendous security challenges as we move into the next century. If the US is to remain engaged in world affairs, then it must maintain an expeditionary military capability in order to control, when necessary, the littoral regions of the earth.

The United States Marine Corps is developing an operational concept, Operational Maneuver From The Sea (OMFTS), that will enable this country to do just that. But the very strength of OMFTS, with its focus on maneuver, speed and deception, will in turn demand of Navy Medicine a revolution in medical affairs to overcome considerable combat casualty support challenges. The solutions to those challenges will be found through: the development of new combat care medical doctrine; enhancing the skills and redirecting the focus of those responsible for patient stabilization and evacuation; preparing for a change in casualty profile due to changing weapons and participants; and finally - making the best of technological innovations that will ensure the best care is given to injured Marines. The key to understanding the medical demands of tomorrow's OMFTS lies in gaining an awareness and comprehension of "operational art" from the warfighter's perspective. Only then will Navy Medicine truly understand its role as the provider of combat casualty care.

**- Operational Medicine From The Sea -
A Revolution in Medical Affairs**

"Doc Ellis knelt beside my broken body and with this thumbs kept my life from pouring out into the sand, until a tourniquet fashioned from a web belt was tied around my left stump and a towel was pressed tightly into the hole where my right thigh had joined my torso."

Lewis B. Puller, Jr.
Fortunate Son - 1991¹

INTRODUCTION:

The United States Marine Corps' operational concept for the next century - Operational Maneuver From The Sea (OMFTS), was formulated from the tenets of amphibious warfare used throughout the past 50 years. OMFTS introduces a tremendous expansion in both time and space of the capability to project power ashore and some would describe it as a revolution in military affairs.² This explosion in assault capability will in turn, demand of Navy Medicine a corresponding revolution in medical affairs. Navy Medicine, the provider of comfort and care to injured Marines, must first acknowledge that sweeping change is imminent and then begin the process of adapting to support OMFTS as quickly as possible, both organizationally and doctrinally.

In dealing with this issue, a review will be made of relevant Navy Medicine and Marine Corps "White Papers" as well as other related literature. In addition, the challenges and opportunities presented by OMFTS for Navy Medicine will be discussed. Finally, an examination of the subject

of tomorrow's Combat Health Service Support from the perspective of "operational art" will be presented. If the Corps is going to ride the "dragon of change" into the 21st century, "it will," as General Krulak, USMC, put it, "take a commitment to innovation."³ The challenge for Navy Medicine is no less daunting.

FUTURE WAR:

While it is impossible to precisely predict the face of future war, most experts agree that conflict during the next two decades and beyond will "experience a bewildering expansion of the varieties of collective and factional violence."⁴ Although the continuum of conflict (from Peace to Total War) has always existed, it is the number of points along the continuum that will expand, and will in turn challenge this nation and its capacity to control and or defeat our enemies.

According to Ralph Peters -- "...man and his failings will remain at the center of war and conflict, (but) a unique combination of factors will precipitate and shape events."⁵ Some of the pressures and concerns are related to the following: the incompetence of the state, wealth polarization, social division, rise of anti-states (criminal enterprises), resource scarcity (water), and gross overpopulation. Although the implications are many, this view of future war predicts fewer total wars, but more, increasingly violent, limited wars. The "norm" will include exploding lawlessness, civil wars, insurgencies, aftermath instability, intercultural struggles and cataclysmic natural disasters perturbed by uncontrolled population growth.⁶ The strategic military implications are many and demanding. If the United States continues to remain engaged in world affairs, then this country (and its allies) will be forced to maintain a military with both an expeditionary focus and capability.

Confounding this trend toward violent, limited war is the recently developed, but generally accepted "obligation" that our political leaders find a balance between casualties and policy objectives.⁷ World War II was our last total war, one in which nearly 300,000 American lives were lost. But because it was a struggle for our continued existence, the loss of life was believed to have been justified. Mounting casualties during both the Korean and Vietnam (limited) wars, led to the defeat of the incumbent political parties and the eventual cessation of hostilities. If "war is hell", then fighting a limited war is total hell from a political perspective. To add fuel to the fire, the extremely successful (limited) combat actions in Grenada, Panama and the Persian Gulf resulted in few casualties (16, 24, and 293 lives lost, respectively⁸). Thus, it is generally believed that future limited actions will not be as costly in blood and that if they become so - popular support will call a halt to such operations. For recent reminders of the importance of American casualties to the determination of political policy, one must only recall the firefight in Mogudishu and the reluctance to become involved in Bosnia .

So, how does one solve the dilemma of an increasing likelihood of fighting more frequent, violent, long distance, limited wars with the opposing demand for few casualties in limited war situations? The US Marine Corps is meeting this future warfighting challenge with the development of Operational Maneuver From The Sea. It is the task of Navy Medicine to develop a combat health service support concept that will support OMFTS. If done correctly, it should minimize the likely political fallout from an increased tempo of limited, but violent conflict. But most importantly, when done correctly, it will conserve this nation's most precious commodity, the lives of its servicemen and women.

OMFTS - USMC ANSWER TO FUTURE WAR:

Since 1992, the Naval Service has been in metamorphosis, adapting in form to what conflict in the next century may become; a process of changing its perspective from fighting a "blue water" Soviet Empire threat to that of projecting power "Forward ... from the Sea." To validate the images discussed earlier by Ralph Peters, "Chaos in the Littorals"⁹ describes precisely both the focus of future US Naval Service actions as well as the character of conflict expected. If by the middle of the next century "the overarching mission of our military (will be) to preserve our quality of life,"¹⁰ then the littoral regions of the earth -- characterized by great cities (80% of the world's capitals), well-populated coasts (more than three-quarters of the world's population), and the intersection of trade routes -- will indeed be the site of most conflicts.¹¹ Maintaining order in the littorals will require operational capabilities that enable the projection of power ashore over a range from 50 miles offshore to 200 miles inland. It will also require of the forces placed ashore, the ability to adapt to all forces of resistance, ranging from overcoming devastated infrastructure to assisting a friendly people in need of disaster relief to countering the entire spectrum of armed threats. Tomorrow's problems will far exceed today's capabilities.

The main thrust of today's Marine Corps doctrine (developed in the 1930s) is still "ship to shore" assault; the large scale movement (1,800-50,000 troops) of Marines from amphibious support ships a few miles off the coast to an objective area several miles inland. Although many minor changes have occurred in the process over the years, the amphibious feint conducted off of Kuwait City during Desert Storm was doctrinally akin to that carried out at Okinawa in 1945. If today's technological advances did not permit a change

in our operational approach, then the kind of warfare in which we are to become involved would demand it.

Pursuant to the thought process that sees the Marine Corps as first to fight and imagines those same forces spending more, rather than less time, at the pointy end of our nation's diplomatic, economic and military stick, the Marine Corps is actively pursuing a new warfighting concept. OMFTS will provide the National Command Authority a force that is capable of both conducting large scale (ship to shore) amphibious assaults and also smaller, faster, ship to objective assaults. With the purchase and deployment of the mobility triad: the Advanced Amphibious Assault Vehicle (AAA-V), the V-22 Osprey, and the Landing Craft Air Cushioned (LCAC), the Marines will be able to move quickly and efficiently throughout the littoral, anywhere in the world. Furthermore, the integration of sensors (intelligence, surveillance and reconnaissance), precision-guided munitions, and advanced C4I in combination with the mobility triad will permit an increase in assault capability that will challenge old world forces with new world speed, precision and acumen.

OMFTS portends a brilliant, far-reaching, task organized warfighting concept; a veritable continuum of assault capability ranging from large scale amphibious assault to small raids far inland.¹² But, because of its focus on maneuver, speed, and deception, and the range in number of forces assigned, it will present Navy Medicine with numerous challenges as well. As an example of the degree of difficulty faced in providing medical care to OMFTS, casualty care was designated a non-player in the recently completed (March '97) Hunter-Warrior exercise at Camp Pendleton.¹³ Hunter-Warrior was the first stage in the testing of Sea Dragon, an Advanced Concepts Development Experiment designed to test the "do-ability" of OMFTS.

NAVY MEDICINE - TODAY AND TOMORROW:

In much the same way that the Marine Corps has retained its ship-to-shore doctrine over the past 50 years, Navy Medicine's system of care for Marine combat casualties has existed relatively unchanged since World War II. As outlined in Attachment 1, the system by which wounded Marines are recovered, stabilized, and moved to hospital ships, Casualty Receiving and Treatment Ships (CRTSs), and when required out of the theater for convalescent care, has been defined by echelons of care. The underlying goal of the traditional casualty care system has been the conservation of the fighting force, with an effort made to hold as many of the more lightly wounded in the communications zone with the expectation that they might be returned to duty. This system was designed to provide certain designated levels of care at specific locations behind the forward edge of the battlefield; requiring the movement of the patient to fixed facilities.

As defined by Naval Warfare Publication 4-02¹⁴ and as seen in Attachment 2, the existing process has five levels of care. Only the first three levels of care are provided in-theater. Echelon One is simply emergency care, provided by Navy hospital corpsmen trained in emergency medicine and assigned to Marine combat units. Care provided at that level includes examination and evaluation followed by emergency or lifesaving measures: maintenance of airway, control of bleeding, and prevention and control of shock and other injury. If the assault has been underway for a time, Echelon One care might also be provided by a Battalion Aid Station, manned by corpsmen and a Navy physician. As soon as feasible and when necessary, the patient is moved to Echelon Two care. This enhanced level of care is considered initial resuscitative care and includes surgical and medical resuscitation capable of saving life or limb, and stabilization of patients for

further evacuation. During the initial hours of an assault, a patient needing Echelon Two care typically might be evacuated via helicopter through a Battalion Evacuation Station to a CRTS (LPD, LHA, LPH...) offshore. After the ground combat element is well established ashore, parts or all of a Medical Battalion, consisting of three Surgical Companies and eight Shock and Trauma Platoons, will also have been moved ashore. Echelon Two care provided by a Medical Battalion would include surgical capability as well as basic laboratory, pharmacy, radiology and holding ward facilities. If further care is required, the patient is then moved to Echelon Three level care which is provided aboard a hospital ship or the nearest Fleet Hospital ashore in the theater of operations.

The process of casualty care just outlined requires a substantial shore-based logistics commitment. In the event that an entire Medical Battalion were moved ashore, more than 550 persons (doctors, nurses, staff officers, corpsmen and Marine Corps support personnel) with accompanying operating rooms, holding wards and associated support facilities would be involved.¹⁵ Again, this is today's doctrine and it represents a time-tested methodology for combat casualty care. It was used successfully during the invasion of Okinawa in 1945 as well as in Desert Storm, 1991. But is it relevant in supporting the requirements of tomorrow's OMFTS?

The expansion in assault capability that OMFTS offers warfighters will demand a matching capability in those providing combat casualty care. Providing medical support to OMFTS will require an ability to task organize medical care teams for individual missions ranging from traditional ship-to-shore amphibious assaults to nighttime raids 200 miles inland, as well as a multitude of missions other than war. It will also require a change in doctrine whereby care in many cases is brought to the casualty, rather than bringing

the casualty to an echelon of care. Most importantly, it will require an emphasis on casualty stabilization and evacuation rather than treatment in the area of operations and conservation of the fighting force.¹⁶

Simply put, the ship-to-objective strategy of OMFTS will eliminate the need for, and ability to provide a buildup of a logistics base ashore -- raising two immediate problems. First, the logistics footprint has historically provided wounded Marines Echelon Two Medical Battalion care, stabilizing them for transport and follow-on treatment. In an OMFTS environment, the distance an injured Marine must be transported will increase from 10-15 miles (shore-to-ship) to 100-250 miles (objective to over-the-horizon ship); reinforcing the need for patient stabilization before evacuation. But, while the need for onsite Echelon Two care to provide the requisite stabilization will increase, the ability to provide that care will decrease. Second, a transition to ship-based logistics will add a significant combat loading challenge to Navy Medicine, requiring the ability to store, access, and task-organize a myriad of medical supplies, equipment, and personnel for a similarly mixed range of medical contingences. It is not unlikely that an assigned Health Service Support team might be required to provide a portion of a Medical Battalion for the buildup of a headquarters area while at the same time providing medical support teams to two or three raiding parties several hours away from an air-evacuation perspective.

OTHER CHALLENGES:

* Tempo - the speed at which some future operations occur will be considerably compressed. That will in turn increase the importance of physical conditioning and acclimatization of the assault forces to the onscene climatic extremes of cold, heat, and/or humidity. Normally it takes several weeks to fully acclimatize a fighting force and performance is directly related

to time of acclimatization. The commander who ignores this factor will see a significant loss in performance of his subordinates. Additionally, the immediate availability of ample supplies of treated water (also directly related to performance) will become an extremely high priority.

* Preventive Medicine Concerns - It has only been since the end of the conflict in Vietnam that preventable diseases (food and water-borne diarrheas, malaria, typhus etc.) have not caused at least half of the casualties in American wars. In fact, during Operation Desert Shield/Storm, noncombat injuries (including accidents) far outnumbered combat-related injuries as a cause for medical evacuation, even during the combat phases of the mission.¹⁷ The reduction in disease nonbattle injuries has resulted directly from the efforts of preventive medicine experts supporting the combat element. Their provision of food and water sanitation, waste treatment, environmental health and entomological expertise has been instrumental in improved health conditions. Providing the same level of support in an OMFTS environment will be much more difficult and will require considerably greater reliance on training, a much greater focus on obtaining and heeding country-specific medical "intelligence", as well as a greater emphasis on the use of personal preventive measures such as vaccines, immunizations, chemical prophylaxis, bed nets and repellent-impregnated uniforms. As our recent operations in Haiti and Somalia have proven, missions other than war will provide numerous challenges for medical support teams, especially those called upon to provide services to civilian populations.

* Evacuation of wounded Marines from an objective area will require more than today's reliance on opportune lift (whatever is available) to move stabilized patients to the CRTSs offshore. It will demand changes in doctrine

that assign dedicated (and expensive) evacuation airlift for all combat missions ashore as well as the assignment of medical support teams to provide in-transit care.¹⁸

* Medical teams assigned to OMFTS assault forces may have to combat a new challenge, that of personal defense. Some units will be close to, if not on, the forward edge of the battle area, as opposed to being within a well defined and well defended logistics base during a typical assault. In addition to needing or becoming involved in providing perimeter defense, medical support so near the area of conflict may raise Geneva Convention concerns about the non-combatant status of assigned medical personnel.

* In the event chemical or biological "defensive" weapons are employed against our forces, having fewer medical personnel and support (cleaning) assets forward will considerably complicate the process of decontamination. Evacuation of such casualties will not be possible until properly decontaminated and then stabilized.

SOLUTIONS:

While some might argue whether OMFTS is evolutionary or revolutionary, the demands it will place on Navy Medicine are certainly revolutionary. Little has changed in the casualty care process during the past 50 years; adapting to OMFTS will demand a fresh, entirely new approach.

First - it will require new medical doctrine¹⁹ that is task organized and supported, focused on time (from injury to ship) rather than echelons of care; one that can be supported by ship-based logistics, reacting to logistics pull rather than push; one that demands and provides command and control for patient flow and tracking.

Second - it will require enhanced skills of those providing care, a focus on patient stabilization and preparation for evacuation; perhaps requiring a

larger and different mix of expertise onsite: more independent duty corpsmen, trauma-trained nurses, physician's assistants or nurse practitioners, and perhaps even scarce physicians. It will also require an increase in the number of personnel trained as Air Medical Crewmen, to provide the requisite care to Marines while in flight to the CRTSs. Providing medical support in an OMFTS environment will also require a greater reliance on the individual Marine -- a higher level of expertise in providing initial medical support for a wounded buddy.

Third - future war and conditions other than war will cause a different casualty profile. More civilian casualties will be seen, especially when fighting occurs in urban environments. Also, more women in combat will change the casualty profile. Finally, the range of injuries will change as weapons such as lasers, precision-guided munitions, and chemical and biological weapons become more common.²⁰

Fourth - Navy Medicine must make the best of technological innovations. Navy Medicine should demand that significant improvements be made in prevention of trauma through the development and use of the latest, most advanced body armor. Other ideas include the use of individual monitoring devices worn by combatants, that telemetrically provide notice of injury, GPS location coordinates as well as vital signs (blood pressure, pulse, respiration, blood gasses etc.) to the nearest hospital corpsman.²¹ Since most battlefield deaths occur in the first "golden hour" after wounding, fatality rates can be substantially reduced when the wounded are quickly stabilized. Critical to that stabilization is the development and fielding of artificial resuscitative fluids composed of synthetic chemicals as well as having the ability to convert various bloodtypes to a universal donor type.²² The Army's LSTAT (Life Support for Trauma and Transport) concept envisions a mini-

intensive care unit and evacuation platform that would replace the stretcher²³ and could be "sky-hooked" from the scene of the injury to the nearest medical facility.²⁴ Another possibility would include aggressively developing methods for placing the injured in a form of suspended animation prior to evacuation.²⁵ Navy Medicine should pursue these ideas diligently; assigning research fellows and forming coalitions with industry to fund, seek, and obtain such alternatives.

Finally, this revolution in medical affairs will require the development of an entirely new training package as well as a process for tracking individual readiness skills for all Navy Medicine personnel. It isn't happening now.

"The current fleet operational medical training requirements and syllabi, although mandated by instruction, are neither current, well defined, nor adequately funded to ensure a ready medical force. They are not grounded in doctrine, and they were, to a large degree, developed without the benefit of current operational medical expertise... A new training doctrine is needed to ensure that the medical personnel augmenting hospital ships and large amphibious assault ships (and supporting the FMF) are properly trained for their roles in the new littoral warfighting doctrine."²⁶

The transition from peacetime CONUS hospital to combat area medical support has never been as different as it will be in the OMFTS future and it will require a tremendous effort to provide the necessary support.

OPERATIONAL ART - A MEDICAL CONCEPT TOO:

It has been suggested that the American Civil War marked the line of demarcation between the "classic" Napoleonic style of military art -- that of massing forces at a single point, and the development of modern operational

art -- in which simultaneous and successive operations were integrated both temporally and spatially into one coherent whole.²⁷ From a medical perspective however, the process of combat casualty care did not change dramatically at that time. In fact, the "tactics" of (USN-USMC) operational medicine, the processes of retrieving and aiding combat casualties, have changed little during the past century.

If in the past, little importance was placed by military medicine on understanding the intricacies of operational art, the complexity of tomorrow's battlespace and the need to task-organize and support an array of missions in different locations, at the same time will make it essential that medical planning/concepts blend with and support the operational level of war. As recently as the Gulf War, it appears that Navy Medicine was not aware of those responsibilities. According to a recent GAO report:

"Navy medical units were given missions by the theater command that they were neither designed, staffed, nor equipped to perform. These missions included handling more casualties than they were designed for, providing non-combat medical care, supporting the evacuation of casualties out of theater, and receiving large numbers of chemically contaminated casualties."²⁸

Some of the considerations of operational art that apply directly to operational medicine are the following: the operational factors of time, space, and forces; the operational functions of command and control, intelligence, logistics and protection; the principles of war and operations other than war (objective, mass, maneuver, unity of command, security, and simplicity); the warfare elements of critical factors, center of gravity, maneuver and

culmination; the influence of operational leadership; and finally understanding the theater structure and levels of war.²⁹

As one begins to understand these concepts, it becomes easier to analyze, then find solutions to operational medicine problems. For example - the problem of providing increased stabilization capability to wounded Marines 220 miles from a CRTS can be more easily visualized, studied, then solved when considered from a space, time, force orientation. If the art of warfare is to obtain and maintain freedom of action³⁰, then the solution to the above problem will be achieved by properly balancing the operational factors. In this example, time and space (distance) are intricately interwoven because each affects the survival of the wounded Marine and in turn drives the number (and ability) of (medical) forces assigned to the task. Furthermore, the medical planner who understands the warfighter's primary operational objective, how US forces will be maneuvered to obtain that objective, the importance of logistics, intelligence, unity of command as well as the centers of gravity of both the friendly and enemy forces -- will better appreciate the criticality of medical support to a successful operational plan.

"Before we begin to determine the dosages for the cure, we must first understand the very nature of the disease."³¹

Operational Art is a systems approach to war fighting that demands a similar and complementary approach from those responsible for healing the warfighters. The continuum of conflict that will be faced in the near future, to include disaster relief, nation building, counterinsurgency, peace keeping, limited and total war, will require that Navy Medicine understand the nuances of each particular operation as well as the unique medical requirements of each operation. It is imperative that tomorrow's operational medical leaders

understand and apply the tenets of operational art. Navy Medical Department officers can no longer be merely medical professionals that wear a uniform, but must become Naval Officers who are both steeped in the philosophy of the supported warfighters, and are able to heal them. This necessary change in approach will result in the true revolution in medical affairs that is required if we are to support OMFTS during the next two decades.

CONCLUSIONS:

- The face of future war has changed forever.
- The USMC is adapting to that change through OMFTS.
- The intricacies of future war and OMFTS will challenge Navy Medicine.
- The medical solutions to supporting OMFTS lie in understanding the operational art of warfare.

NOTES

¹ A Concept for Casualty Care for Operational Maneuver From the Sea, Marine Corps Combat Development Command and Naval Doctrine Command "White Paper", January 1997, p. 19.

² According to Andrew F. Krepinevich, a RMA occurs "when the application of new technologies into a significant number of military systems combines with innovative operational concepts and organizational adaptation in a way that fundamentally alters the character and conduct of conflict." The key, marking a true revolution in contrast to an on-going evolution of military affairs, is "the recognition, over some relatively brief period, that the character of conflict has changed dramatically, requiring equally dramatic - if not radical- changes in military doctrine and organizations." From: Andrew F. Krepinevich, "Calvary to Computer: The Pattern of Military Revolutions," The National Interest, Fall 1994, 30-42.

³ GEN Charles C. Krulak, USMC, "Operational Maneuver From the Sea", U.S. Naval Institute Proceedings, January 1997, p. 31.

⁴ Ralph Peters, "The Culture of Future Conflict", Parameters, Winter 1995-96, p. 18.

⁵ Ibid, p. 18.

⁶ Ibid, p. 23.

⁷ Karl W. Eikenberry, "Take No Casualties", Parameters, Summer 1996, p. 110.

⁸ Ibid, 113.

⁹ Operational Maneuver From The Sea, A Concept for the Projection of Naval Power Ashore. Commandant, U.S. Marine Corps, Washington, D.C., 14 January 1996, p. 3.

¹⁰ Peters, 25.

¹¹ Operational Maneuver From The Sea, p.3.

¹² Ibid.

¹³ COL James A. Lasswell, USMC, Report on Hunter-Warrior, Naval War College Lecture, 9 April 1997.

- ¹⁴ Operational Health Service Support NWP 4-02, Department of the Navy, Office of the Chief of Naval Operations, August 1995.
- ¹⁵ The total weight of all equipment for a Medical Battalion is more than 2.4 million pounds, requiring 311,000 cubic ft of load space. If moved via airlift, it would require 76 C-130 or 25 C-17 flights. Ref: Phonecon to CO 2nd Medical Battalion of 7 May 97.
- ¹⁶ A Concept for Casualty Care for Operational Maneuver From the Sea.
- ¹⁷ Charles L. Levy and Trueman W. Sharp, "Medical Challenges for Deploying Forces," Marine Corps Gazette, February 1997, p. 54.
- ¹⁸ A Concept for Casualty Care for Operational Maneuver From the Sea.
- ¹⁹ Considerable work is presently underway at the Marine Corps Combat Development Command. My sincere thanks to CAPT W. F. Frank, MSC, USN and CDR W. A. Silva, MSC, USN for support, thoughts, and discussions related to this subject.
- ²⁰ Gary E. Horne et al., "Future Challenges for Operational Medicine," Navy Medicine, September-October 1996, 8-13.
- ²¹ William D. Siuru, Jr., "Technology 'That Is Available Now'", Marine Corps Gazette, January 1997, 29-33
- ²² Barry J. Spargo and Francesca C. Music, "Military Transfusion Medicine," Navy Medicine, January-February 1996, 13-16.
- ²³ Siuru, 33.
- ²⁴ COL James A. Lasswell, USMC.
- ²⁵ RADM Rowley, MC, USN, Surgeon General's Conference, August 1996.
- ²⁶ Arthur M. Smith and Henrik V. Petersen, "Matching Fleet Readiness to the New Naval Strategy," Naval War College Review, Winter 1997, p. 30.
- ²⁷ James J. Schneider, "The Loose Marble--And The Origins of Operational Art," Parameters, March 1989, 85-99.
- ²⁸ Arthur M. Smith, "When 'Dialing 9-1-1' Just Won't Work," Marine Corps Gazette, June 1995, p. 54.

²⁹ Milan Vego, Series of lectures and readings on Operational Art presented during Spring Semester-1997, Operations Department, Naval War College, Newport RI.

³⁰ Milan Vego, "Operational Factors," Operations Department, Naval War College, Newport RI., September 1996.

³¹ John D. Waghelstein, Naval War College Lecture on Counter-Terrorism, 6 May 97.

Bibliography

Allen, Ralph L., "Piercing the Veil of Operational Art," Parameters, Summer 1995, 111-119.

Mundy, Jr., Carl W., "Thunder and Lightening: Joint Littoral Warfare," Joint Force Quarterly, Spring 1994, 45-50.

"Operational Maneuver From The Sea, Challenge and Opportunity," Amphibious Warfare Review, Winter/Spring 1996, 10-14.

Peters, Ralph, "After the Revolution," Parameters, Summer 1995, 7-14.

Sapolsky, Harvey M. and Jeremy Shapiro, "Casualties, Technology, and America's Future Wars," Parameters, Summer 1996, 119-127.

"Sea Dragon and CMC's Warfighting Lab - Vision of Tomorrow's Marine Corps," Amphibious Warfare Review, Winter/Spring 1996, 23-28.

Vego, Milan, "Fundamentals of Operational Design," Operations Department, Naval War College, Newport RI., August 1996.

Ibid, "Operational Art", Operations Department, Naval War College, Newport RI., August 1996.

Ibid, "Operational Functions," Operations Department, Naval War College, Newport RI., August 1996.

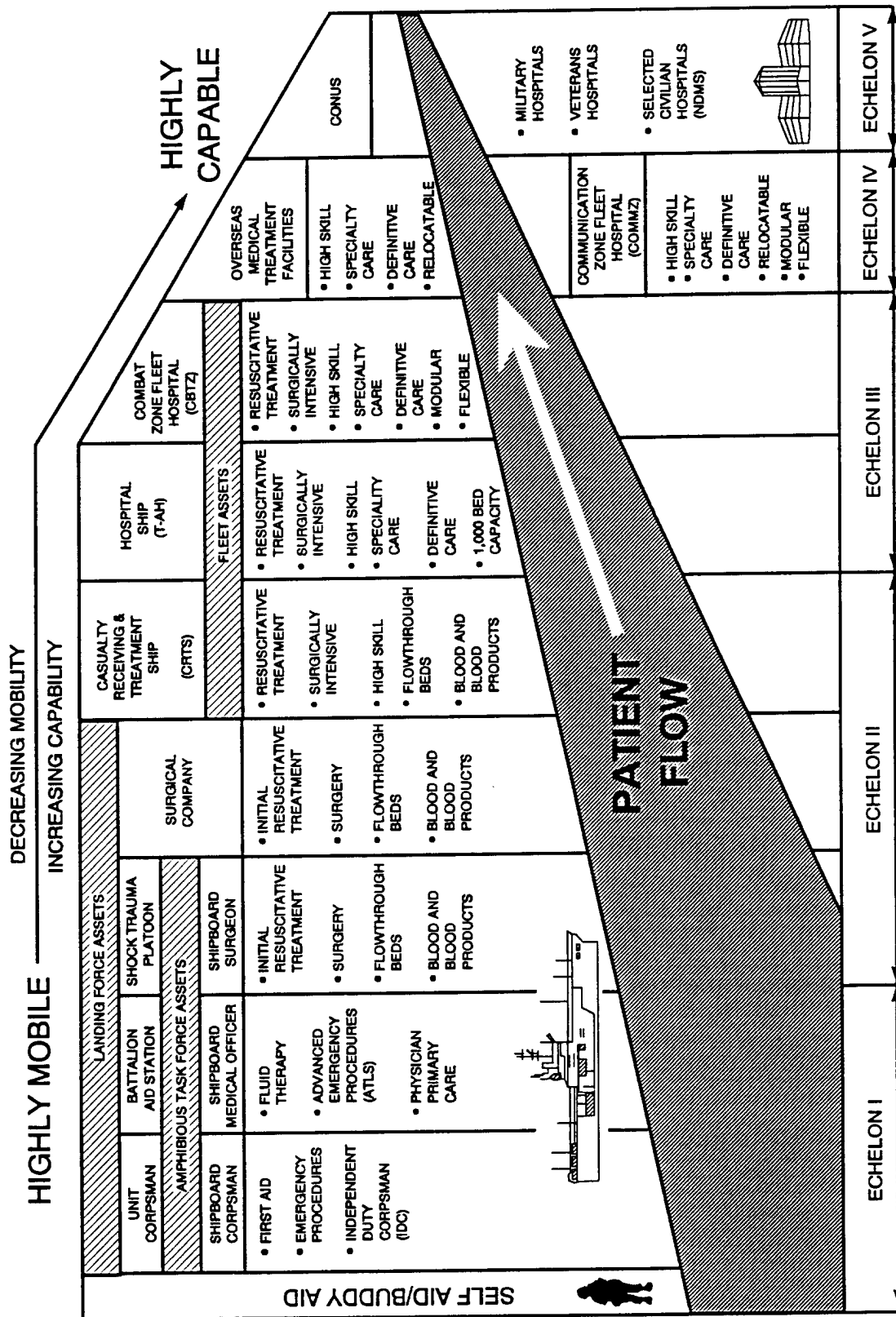


Figure 4-1. Continuum Care

ECHELONS	LEVELS OF HEALTH CARE	RESOURCES
I	<ul style="list-style-type: none"> — First Aid — Emergency Care 	<ul style="list-style-type: none"> — Self/Buddy Aid — Aid Station — HSS Personnel
II	<ul style="list-style-type: none"> — Initial Resuscitative 	<ul style="list-style-type: none"> — Shock Trauma Platoon — Surgical Company — Shipboard Surgical and Holding Capability
III	<ul style="list-style-type: none"> — Resuscitative 	<ul style="list-style-type: none"> — T-AH — CBTZ Fleet Hospital
IV	<ul style="list-style-type: none"> — Definitive 	<ul style="list-style-type: none"> — COMMZ Fleet Hospital — OCONUS MTF/DTF
V	<ul style="list-style-type: none"> — Convalescent, — Restorative, — Rehabilitative 	<ul style="list-style-type: none"> — CONUS MTF/DTF — Veterans Administration — National Disaster Medical System Hospitals

Figure 1-3. Echelons of Care

Casualties are evacuated through the HSS system until they arrive at a facility having the capabilities required to begin decisive intervention, the time required to perform necessary procedures, and the bed capacity to retain the patient. This MTF or echelon of care is defined as the site of principal treatment.

1.5.1 Echelon I: First Aid/Emergency Medical Care. Echelon I provides basic first aid (self or buddy). Self aid and buddy aid training are required for all Navy and Marine Corps personnel. Emergency medical care is provided by HSS personnel, for example, a hospital corpsman trained in emergency medical techniques, an IDC, or a medical department officer. In the fleet, trained hospital corpsmen will staff the medical departments on small ships and provide emergency care independent of a medical officer. On ships with medical officers assigned, the capability for a more advanced level of resuscitative care exists. In the FMF, hospital corpsmen represent the portal of entry at which a sick, injured, or wounded Marine receives medical care. Care rendered by the hospital corpsmen includes examination and evaluation followed by emergency or lifesaving measures such as maintenance of airway, control of bleeding, and prevention and control of shock and other injury. The medical officer renders treatment at the BAS, and provides initial resuscitation along with routine health care.

1.5.2 Echelon II: Initial Resuscitative Care. Echelon II provides initial resuscitative care in the form of surgical and medical resuscitation. This care saves life and/or limb and stabilizes patients for evacuation to Echelon III. Blood and blood products are available at Echelon II. The facilities will be manned by general

surgeons and anesthesiologists and/or nurse anesthetists. Other specialties may also be represented. Ancillary support that is provided, particularly laboratory and radiology, is minimal. In the fleet, this level of care is available on the larger ships. For example, surgical capability will be provided by an aircraft carrier in a carrier battle group and by the CRTS of an amphibious battle group. In the FMF, the medical battalion consists of three Surgical Companies and eight STPs that provide Echelon II care, which includes surgical capability, basic laboratory, pharmacy, radiology, and holding ward facilities. The objective of this phase of treatment is to perform those emergency surgical procedures which constitute resuscitation and, without which, death or serious loss of limb and/or body function is likely to occur. Surface or air evacuation arrangements, for those patients requiring a more comprehensive scope of treatment, are directed toward a facility that can provide the required treatment.

1.5.3 Echelon III: Resuscitative Care. Echelon III provides a higher level of surgical and medical resuscitative capability. In addition to general surgeons and orthopedists, other surgical specialists will be present. The HSS provided by these facilities — for example, the T-AH and CBTZ fleet hospital — will have greater capabilities, particularly in laboratory and radiology support. The scope of treatment requires clinical capabilities normally found only in a hospital properly staffed, equipped, and located in an environment with a low level of threat from enemy action. This level of care constitutes the definitive treatment that is needed to return many patients to full duty.